



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,809	08/25/2003	Thomas J. Kelly	08350.3304-03	1320
58982 7590 02/07/2007 CATERPILLAR/FINNEGAN, HENDERSON, L.L.P. 901 New York Avenue, NW WASHINGTON, DC 20001-4413			EXAMINER PARK, JEONG S	
			ART UNIT	PAPER NUMBER
			2109	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/07/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/646,809

Applicant(s)

KELLY ET AL.

Examiner

Jeong S. Park

Art Unit

2109

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/25/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/28/2004, 4/2/2004, 8/29/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to because:

All reference characters for rectangular boxes in Figure 1-4, 7, and 14 do not disclose any labeled descriptive text. In order to understand clearly the rectangular boxes shown in the drawings should be provided with proper descriptive text labels with matching reference characters.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 1, 2-5, 10-17, and 25-38 are objected to because of the following informalities:

In claim 1, line 6, "a first set of work machines", it should be corrected as - -a first set of the work machines- - for clear understanding because it was mentioned in the same claim as a plurality of work machines;

In claim 1, line 7, "the work machine's current location", it should be corrected as - -the respective work machine's current location- - for clear understanding because it was mentioned in the same claim;

In claim 1, line 9, "a second set of work machines", it should be corrected as - -a second set of the work machines- - for clear understanding because it was mentioned in the same claim as a plurality of work machines;

In claim 1, line 16, "second set of work machines", it should be corrected as - - second set of the work machines- - for clear understanding because it was mentioned in the same claim as a plurality of work machines;

In claim 2, line 4, it appears that it should be corrected as - -the third work machine- - instead of "the second work machine" based on the context of claim 1;

In claim 3, line 4, it appears that it should be corrected as - -the third work machine- - instead of "the second work machine" based on the context of claims 1 and 2;

Art Unit: 2109

In claim 3, lines 1-2, "a destination work machine", it should be corrected as - - the destination work machine- - for clear understanding because it was mentioned in claim 2, line 2;

In claim 4, lines 1 and 7, "the first set of work machines", it should be corrected as - -the first set of the work machines- - for clear understanding because it was mentioned in claim 1 as a plurality of work machines;

In claim 5, lines 1-2, "a second set of work machines", it should be corrected as - -the second set of the work machines- - for clear understanding because it was mentioned in claim 1;

In claim 10, line 6, "the cost", it should be corrected as - -a cost- -;

In claim 11, lines 1-2, "a destination work machine", it should be corrected as - - the destination work machine- - for clear understanding because it was mentioned in claim 2, line 2;

In claim 12, lines 1-2, "a destination work machine", it should be corrected as - - the destination work machine- - for clear understanding because it was mentioned in claim 2, line 2;

In claim 13, line 10, "a first set of work machines", it should be corrected as - -a first set of the work machines- - for clear understanding because it was mentioned in the same claim;

In claim 13, line 12, "a second set of work machines", it should be corrected as - - a second set of the work machines- - for clear understanding because it was mentioned in the same claim;

Art Unit: 2109

In claim 13, line 23, it appears that it should be corrected as - -included in the second set- - instead of "included in the first set" based on the context of claim 1, lines 11-14;

In claim 14, line 3, "second set of work machines", it should be corrected as - - second set of the work machines- - for clear understanding because it was mentioned in claim 13;

In claim 15, line 2, "second set of work machines", it should be corrected as - - second set of the work machines- - for clear understanding because it was mentioned in claim 13;

In claim 15, line 3, "a third set of work machines", it should be corrected as - -a third set of the work machines- - for clear understanding because it was mentioned in claim 13;

In claim 16, line 7, "the first set of work machines", it should be corrected as - - the first set of the work machines- - for clear understanding because it was mentioned in claim 13;

In claim 17, line 3, "an admission packet", it should be corrected as - -the admission packet- - for clear understanding because it was mentioned in claim 16, line 3;

In claim 25, lines 21-22, it appears that it should be corrected as - -the third work machine- - instead of "the third network work machine" based on the context of previous claims;

In claim 26, line 7, "a first set of work machines", it should be corrected as - -a first set of the work machines- - for clear understanding because it was mentioned in the same claim as a plurality of work machines;

In claim 26, lines 10 and 17, "second set of work machines", it should be corrected as - -second set of the work machines- - for clear understanding because it was mentioned in the same claim as a plurality of work machines;

In claim 27, line 4, it appears that it should be corrected as - -the third work machine- - instead of "the second work machine" based on the context of claim 26;

In claim 28, line 2, "a destination work machine", it should be corrected as - -the destination work machine- - for clear understanding because it was mentioned in claim 27, line 2;

In claim 28, line 4, it appears that it should be corrected as - -the third work machine- - instead of "the second work machine" based on the context of claims 26 and 27;

In claim 29, lines 2 and 7, "the first set of work machines", it should be corrected as - -the first set of the work machines- - for clear understanding because it was mentioned in claim 26;

In claim 30, line 2, "a second set of work machines", it should be corrected as - -the second set of work machines- - for clear understanding because it was mentioned in claim 26, line 10;

In claim 30, lines 2 and 5, "set of work machines", it should be corrected as - -set of the work machines- - for clear understanding because it was mentioned in claim 26;

Art Unit: 2109

In claim 31, lines 3 and 6, "set of work machines", it should be corrected as - - set of the work machines- - for clear understanding because it was mentioned in claim 26;

In claim 32, lines 3 and 4, "set of work machines", it should be corrected as - - set of the work machines- - for clear understanding because it was mentioned in claim 26;

In claim 33, line 2, "set of work machines", it should be corrected as - - set of the work machines- - for clear understanding because it was mentioned in claim 26;

In claim 34, line 3, "set of work machines", it should be corrected as - - set of the work machines- - for clear understanding because it was mentioned in claim 26;

In claim 35, line 7, "the cost", it should be corrected as - -a cost- -;

In claim 36, line 2, "a destination work machine", it should be corrected as - -the destination work machine- - for clear understanding because it was mentioned in claim 27, line 2;

In claim 37, line 2, "a destination work machine", it should be corrected as - -the destination work machine- - for clear understanding because it was mentioned in claim 27, line 2;

In claim 38, lines 6 and 9, "set of work machines", it should be corrected as - -set of the work machines- - for clear understanding because it was mentioned in the same claim as a plurality of work machines;

In claim 38, line 7, "the work machine's current location", it should be corrected as - -the respective work machine's current location- - for clear understanding because it was mentioned in the same claim;

In claim 38, line 16, "a first set ", it should be corrected as - -the first set- - for clear understanding because it was mentioned in the same claim; and

In claim 38, line 16, "a second set ", it should be corrected as - -the second set- - for clear understanding because it was mentioned in the same claim.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter; or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-3, 6-15, 17-24, and 26-38 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Independent claims 1 and 38 are drawn towards a method comprising determining a first and second set of work machines, forwarding a packet, and updating the work machines. This can be just an abstract idea. In order for an abstract claim to be statutory, it must result in useful, concrete, and tangible results. The final result achieved by the claimed invention does not produce any tangible result.

Claims 2, 3, and 6-12, which are dependent on claim 1, do not add any tangible results to the claim and thus are rejected for the same.

Independent claim 13 is drawn towards a system comprising a first work machine, a network table, and a first gateway, which is configured to update the network table, receive a packet, forward the packet, and send an information from the packet to a data link. This can be just an abstract idea. In order for an abstract claim to be statutory, it must result in useful, concrete, and tangible results. The final result achieved by the claimed invention does not produce any tangible result.

Claims 14, 15, and 17-24, which are dependent on claim 13, do not add any tangible results to the claim and thus are rejected for the same.

Claims 26-37 are drawn towards a computer-readable medium, which is not in one of the statutory categories. The specification provides no explicit and deliberate definition of the computer-readable medium. Also this can be just an abstract idea. In order for an abstract claim to be statutory, it must result in useful, concrete, and tangible results. The final result achieved by the claimed invention does not produce any tangible result.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 6-9, 16, 17, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE Conference Proceeding (hereinafter IEEE)(Ad-hoc on-demand distance vector routing by Perkins et al., published in Mobile Computing Systems and Applications, 1999 Proceedings, WMCSA "99 Second IEEE Workshop on 25-26 February 1999, Pages: 90-100) in view of Walker et al. (hereinafter Walker)(U.S. Pub. No. 2003/0028811 A1).

Regarding claims 1, 13, 25, and 26, IEEE discloses the claimed inventive concept of dynamically establishing an ad-hoc network including a plurality of mobile nodes refers to laptop computers (Ad-hoc On Demand Distance Vector Routing (AODV)

is an algorithm for the operation of an ad-hoc network which is the cooperative engagement of a collection of mobile nodes, see, e.g., Abstract, lines 1-6), one or more of which may move within a work environment (a collection of mobile nodes) and each of which includes a gateway (each mobile host operates as a specialized router which functions as a gateway, see, e.g., Abstract, lines 6-9), the method performed by a respective gateway included within a respective one of the work machines comprising:

A gateway with a first interface connected to an on-board data link and a second interface connected to an off-board data link (mobile host operates as a router, which means one data link through a interface to other router for network connections and another data link through another interface to the upper layer, which handles an application layer as a network host, see, e.g., page 1, Abstract);

A network table (each mobile node maintains a route table which includes destination and next hop, which means a packet is routed to the next hop, which has connection to the destination, based on the destination information, see, e.g., page 4, section 2.2, third paragraph);

Determining a first set of work machines within direct communication range of the respective work machine (mobile node)(nodes learn of their neighbors, see, e.g., page 5, section 2.4, lines 1-4);

Determining a second set of work machines in direct communication range of one or more of the work machines in the first set (all intermediate nodes between destination and source nodes, shown on Figure 2, know the forward and reverse path, see, e.g., page 3, section 2.1.2, paragraph 2);

Forwarding a packet received from a first work machine to a third work machine (forwarding a packet from a node to the other node based on the route determined by determining step above, see, e.g., Figure 2, page 3, section 2.1.2, second paragraph, and page 4, section 2.2, second paragraph); and

Updating the work machines based on changes (updating local connectivity of mobile nodes' information, see, e.g., page 5, section 2.4, first paragraph, and path maintenance, see, e.g., page 4, section 2.3, first paragraph).

IEEE does not disclose the use of the ad-hoc network in work machines.

The general concept of applying the ad-hoc in work machines is well known within the art as illustrated by Walker which discloses laptops, same as mobile nodes, used in a medical industry which is one of particular industries, since the specification defined the work machine as a fixed or mobile machine performs some type of operation associated with a particular industry (see, e.g., page 2, paragraph [0017], and Figure 2).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE to include using laptops as work machines in a particular industry (medical industry), as taught by Walker in order to utilize laptops in the ad-hoc network system cost efficiently.

Regarding claims 2, 3, 22-24, 27, and 28, IEEE discloses forwarding a packet to the destined or any work machine via second and third work machines based on the determination achieved by the claim 1 (sending data transmission after determining a

Art Unit: 2109

route from source to destination node based on the route table in each node, see, e.g., page 3, third paragraph, page 4, section 2.2, third paragraph).

Regarding claims 4, 5, 16, 17, 29, and 30, IEEE discloses broadcasting an admission packet (hello message) periodically (within hello-interval), receiving or collecting a response, and adding at work machines (nodes) based on the received response (broadcasting a hello message to all its neighbors periodically within hello-interval in order to update their local connectivity information to each node, see, e.g., page 5, section 2.4, first paragraph).

Regarding claims 6-9, 14, 18, 19, and 31-34, IEEE discloses updating the respective work machine periodically based on the location and removing any work machines not in direct communications with any work machines (Each node broadcasts a hello message to its neighbors periodically within hello-interval so all nodes are updated their current locations periodically which includes removing old nodes and adding new nodes, see, e.g., page 5, section 2.4, first paragraph).

Regarding claims 11 and 36, IEEE discloses forwarding a destined packet to the second work machine based on the first network table (each mobile node maintains a route table which includes destination and next hop, which means a packet is routed to the next hop, which has connection to the destination, based on the destination information, see, e.g., page 4, section 2.2, third paragraph).

Regarding claim 21, IEEE discloses translating the information in a received packet to an on-board data link (mobile host, as well known within the art, handles an application layer as a network host, so if the packet is destined to that host, then it will

Art Unit: 2109

process the packet to upper layer with an accepted format to the upper layer, see, e.g., page 1, Abstract).

7. Claims 10, 12, 15, 20, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE Conference Proceeding (hereinafter IEEE)(Ad-hoc on-demand distance vector routing by Perkins et al., published in Mobile Computing Systems and Applications, 1999 Proceedings, WMCSA '99 Second IEEE Workshop on 25-26 February 1999, Pages: 90-100) and Walker et al. (hereinafter Walker)(US Pub. No. 2003/0028811 A1) in view of Computer Networks a Systems Approach Section 4.2.2 (by Larry L. Peterson et al., 2nd edition, pages 284-288, published by Morgan Kaufmann Publishers, on October 1999).

Regarding claim 10, 20, and 35, IEEE and Walker teach all the limitations as disclosed above except for selecting one of the at least two data links to forward the packet based on of an availability status of each of the data links.

The general concept of selecting a link among multiple links based on an availability status is well known within the art as illustrated by Computer Networks a Systems Approach Section 4.2.2 which discloses as follows:

Availability status of each of data links (containing the distances (costs) to all other nodes, see, e.g., page 284, section 4.2.2, first paragraph, Figure 4.14, Table 4.6 on page 285);

Initial distances stored at each node (each node knows all connections to its neighbors, see, e.g., page 284, third paragraph, Figure 4.14, Table 4.5 on page 285);

An initial routing table from the step of exchanging its personal list of distances between its directly connected neighbors (see, e.g., page 285, first paragraph, Table 4.5, Figure 4.14); and

A final routing table resulted from a few exchanges of the information between neighbors (see, e.g., page 286, first and second paragraph, Table 4.7 and 4.8, Figure 4.14).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE and Walker to include the distance vector routing concept, as taught by Computer Networks a Systems Approach Section 4.2.2 in order to use link costs as an availability status to select among multiple links.

Regarding claim 12 and 15, IEEE and Walker teach all the limitations as disclosed above except for building and using two network tables to forward a packet to a destination.

The general concept of building and using routing tables is well known within the art as illustrated by Computer Networks a Systems Approach Section 4.2.2 which discloses as follows:

Initial distances stored at each node (each node knows all connections to its neighbors, see, e.g., page 284, third paragraph, Figure 4.14, Table 4.5 on page 285);

An initial routing table from the step of exchanging its personal list of distances between its directly connected neighbors (see, e.g., page 285, first paragraph, Table 4.5, Figure 4.14); and

Art Unit: 2109

A final routing table resulted from a few exchanges of the information between neighbors (see, e.g., page 286, first and second paragraph, Table 4.7 and 4.8, Figure 4.14).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE and Walker to include a routing table which includes all direct and indirect connections for each node, as taught by Computer Networks a Systems Approach Section 4.2.2 in order to simplify the routing process.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeong S. Park whose telephone number is 571-270-1597. The examiner can normally be reached on Monday through Thursday 7:30 - 5:00 EST.

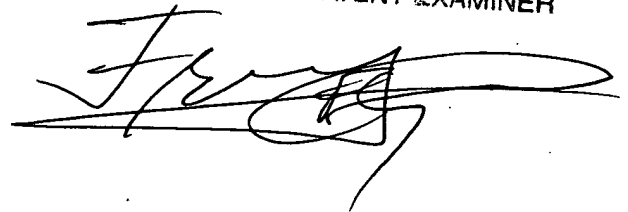
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2109

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JSP
January 29, 2007

FRANTZ JULES
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Frantz', with a large, stylized flourish extending from the end of the name.